CLAIMS

1. A spectrophotometer comprising: light emission means that emits light; a main light reception unit having a group of charge accumulation type photodetection elements which receive, for each wavelength, among light emitted from the light emission means, incoming light after the light has been transmitted through an article to be measured and been spectrally separated by a spectrometer such as a diffraction grating, and which convert the light into an amount of charge to be accumulated; a sample-use light reception unit for accumulating, in the form of an amount of charge, said incoming light that has been spectrally separated and reading the charge of a specified wavelength or specified wavelength band; a pre-amplifier and drive circuit of said main light reception unit and sample-use light reception unit; a variable-gain type amplification circuit whose gain can be varied by a digital instruction; a zero-point compensation circuit provided in the vicinity of at least the final stage of an analogue circuit unit for sequentially acquiring the zero-point of all the amplification systems immediately prior to sequential reading of the charge accumulated on the pixels of said main light reception unit and sample-use light reception unit; and an A/D converter for converting the analogue voltage from the zero-point compensation circuit to a digital value; and further comprising digital comparison

operation means that, in reading the charge accumulated on said main light reception unit and sample-use light reception unit during measurement, first of all amplifies the analogue voltage from said sample-use reception unit in said variable-gain type amplification circuit that is set to a low gain at which obviously the maximum point of the wavelength characteristic of a specified wavelength or specified wavelength band is not saturated, and then, after the amplified analogue voltage has passed through said zero-point compensation circuit, subjects the same to A/D conversion in said A/D converter, and performs a digital comparison operation of the digitally converted digital value with a reference value, which is finally obtained by being read from said main light reception unit, and which is predetermined as an optimum value such that there is no possibility of the maximum point of the wavelength characteristic at the required wavelength or wavelength band being saturated, and such that the number of significant digits of the digital value is not reduced; gain setting means for setting the gain of said variable gain type amplification circuit in accordance with the operation result from the digital comparison operation means; and digital data reading means for acquiring a wavelength characteristic by sequentially reading the group of charges accumulated on said main light reception unit as digital data, in pixel units, through said pre-amplifier and drive circuit, said variable gain type amplification circuit,

said zero-point compensation circuit and said A/D converter after setting the gain in said variable-gain type amplification circuit by the gain setting means.

2. The spectrophotometer according to claim 1, wherein, as said sample-use light reception unit, an optical input window is arranged in an optical region in a specified order of a diffraction grating for light incident of a specified wavelength in the vicinity of the maximum value of the light transmission amount characteristic of the article to be measured; means for guiding light by an optical fiber to the vicinity of a pixel position at the start of reading of a group of charge accumulation type photodetection elements, or a photodiode or photodiode array is arranged in the position of an optical input window in an optical region of a specified order of a diffraction grating.

3. The spectrophotometer according to claim 1, wherein the amount of light transmitted is expressed as: mantissa × exponent, where an exponential type amplification circuit is employed for said variable-gain type amplification circuit, the value of said A/D converter representing the mantissa and said variable gain type exponential amplification circuit representing the exponent (the maximum gain of the circuit being the base and the exponent thereof being the set value).

4. The spectrophotometer according to claim 1, wherein, during the reading of said main light reception unit, when performing comparison operation of the value obtained by said sample-use light reception unit with the reference value, computation is performed including a pixel unit correction function, and gain correction in the pixel units is performed by successively setting said operation results in the said variable-gain type amplification circuit as all the pixels are read.